RCEL 504 Ethics for Engineers – Spring 2022
Syllabus

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Why is ethics important for you?

"Killing is wrong!" "You ought not lie." “Do unto others as you would like them to do unto you”. These are examples of *moral statements*: they are definite “right or wrong” statements. Engineers are often confronted with *ethical dilemmas*: concerns about the safety of the cars, the sustainability of energy, climate change, conflicts of interest, access to information, or justice. These dilemmas don’t typically have simple yes or no, right or wrong answers. In most cases, the best answer is“it depends”.

The main purpose of teaching ethics is to help students identify these ethical issues and address them in an ethical manner. Ethics for engineers is not about theory and philosophy: it is about the application of moral and ethical principles to solve practical engineering issues.

Ethical problems are somewhat analogous to engineering design problems: both involve significant complexities, high degrees of uncertainty, a number of boundary conditions and constraints, conformance with criteria, identification and evaluation of alternatives responses, and deciding on the best solution or action. The skills and competences gained in an ethics course are most important to exercise leadership in both business and engineering.

Some students come to ethics courses with a skeptical attitude. They might think that there are no ethical issues in our profession, or that they will always know how to behave in an ethical manner, or that ethics is not related to engineering. I hope that even skeptics will benefit from an ethical approach to engineering, as all of us will face ethical dilemmas in our professional life. Most engineering classes present problems that have a clear solution. In engineering ethics there are seldom good or bad answers, there are only options, and we need to learnto handle this ambiguity.

Learning objectives

What skills can students gain from this course? The first skill is sensitivity to identify an ethical issue, the second is to determine and analyze the various values and stakeholders in every issue. Finally, the skill to make solid judgements, identify the best actions to take and the resolve to take those actions. There are other skills such as the ability to form your own opinions, to listen to arguments, and to communicate your reasons and decisions. These skills are at the basis of leadership: an ethical leader is a better leader.

Teaching methodology

At RCEL our approach to teaching is to use current case studies that are relevant to our students, such as bioethics, ethics in cyber space, ethics in the classroom, safety, social responsibility, and environmental justice. We strive to connect the learning experience with practical and immediate applications. Ethics is not theory; it is foremost about application to your academic and professional life.

The classes will include lectures, interviews, film clips, case discussions, analysis of current topics relevant to ethics, student presentations and report. Case discussions and exercises are a vital part of the learning experience, to quickly translate the theoretical knowledge gained from lectures into practical skills through application. There will be a substantial amount of reading

for each class. Participants are expected to complete reading assignments and other preparations in addition to attending classes. Expect to spend 3-5 hours weekly on reading and class assignments, in addition to lectures.

The class will be online via Zoom, until the University policy on in person classes changes.

Course Level

This course is open to both graduate and undergraduate students.

Course Objectives: The objectives of this course are to provide engineering students and practitioners with:

•An understanding of their duties and responsibilities as professionals

• Basic knowledge to make informed ethical decisions when confronted with problems in the working environment.

• Improved awareness of potential ethical issues within an engineering context.

• Team skills through working in teams on assignments and in-class assignments.

• Subjective analytical skills through investigation and evaluation of ethical problems in engineering settings.

• Improved communications skills with regard to ethical and professional issues in engineering.

• Knowledge, understanding and ability to identify and address contemporary issues in engineering ethics.

Expected outcomes

• Students will have an understanding of professional and ethical responsibility.

• Students will have an improved ability to communicate effectively using the language and reasoning of ethics.

• Students will be able to better understand the impact of engineering in a global/societal context, and their own contributions to bettering the world

• Students will gain the ability to critically evaluate "fuzzy" problems, presented in the form of ethical dilemmas, identify the alternative solutions, and decide on a course of action.

• Students will learn of the broader impact of engineering on global issues, such as equality, justice, poverty, human rights, women rights, etc.

Class policies and expectations

The Honor Code of Rice University governs all of your work in this course. If you are uncertain about the application of the Honor Code to a particular assignment, check with me before you begin working on it. Recall that plagiarism of any kind is a violation of the Rice Honor Code.

Generally, plagiarism is the consequential use of another's work without appropriate attribution. If in doubt, cite…

Grading

- Class participation (30%) including:
  - Attendance – mandatory, exceptions only
  - Active participation in class discussions – answering questions, engagement in debates
  - Ability to build on other people's comments
  - Original and controversial thinking are encouraged – there are usually no right or wrong answers, but not answering or participating gives you no credit
- Assignments (50%)
  - Written cases – 10% each. Reports will be written essays or answers to multiple choice questions. Grammar and logical thinking will be considered in thegrades.
  - Quizes – 10%
- Team project report and presentation – 20%

I typically allow 5% extra credit for effort above and beyond the call of duty, such as particularly impressive presentations, reports that cover the topic in outstanding detail, original ideas about engineering ethics, etc.

Accommodation for Disability – If you have a documented disability that will affect your work in this class, please discuss your needs with me. Additionally, you will need to register with the Disability Support Services Offices in the Ley Student Center.